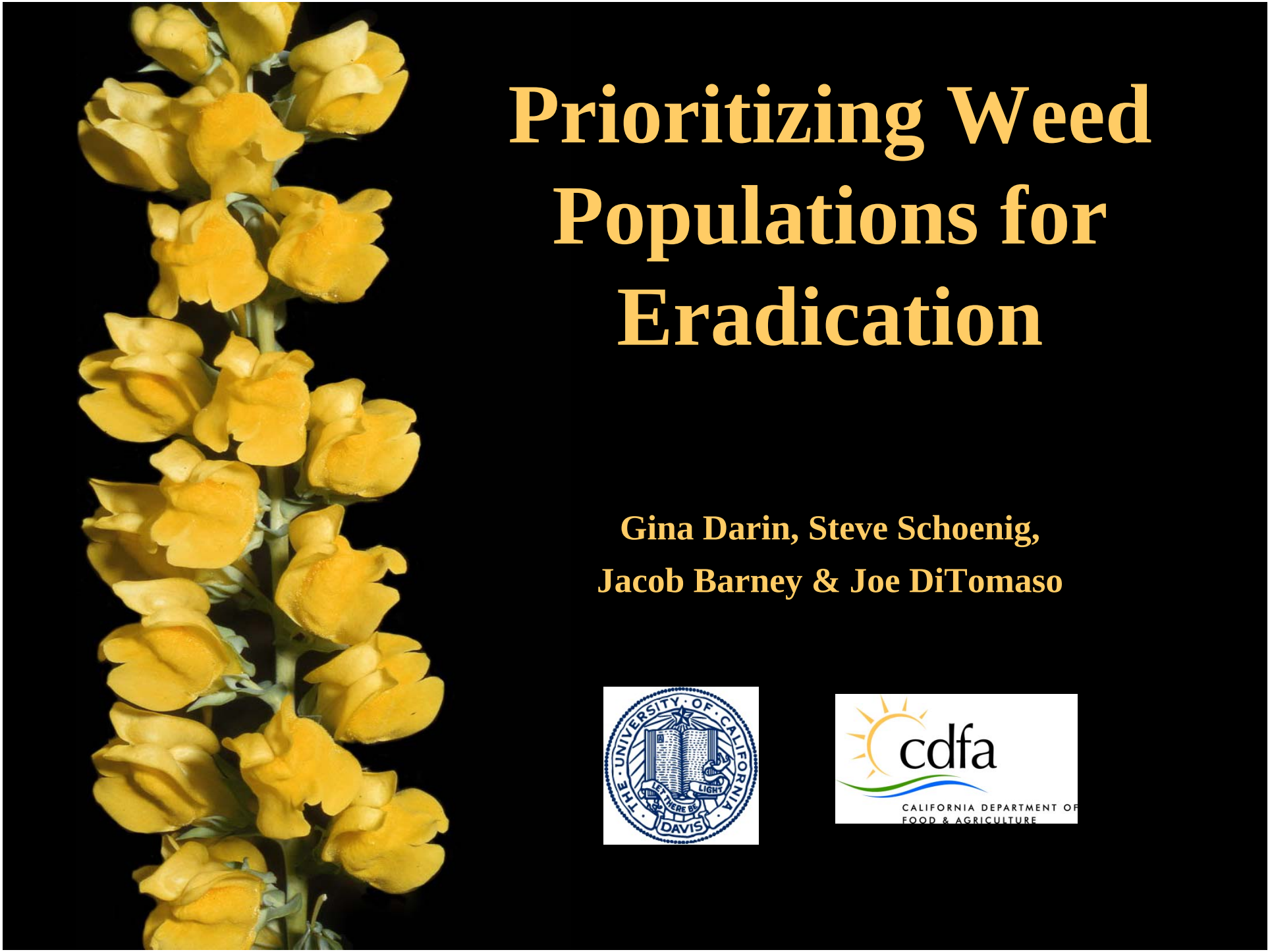


Prioritizing Weed Populations for Eradication

Gina Darin, Steve Schoenig,

Jacob Barney & Joe DiTomaso

Research Objectives

- Identify reasons to prioritize weed populations for eradication
- Develop a method to prioritize populations
- Test the prioritization tool on CDFA's A-rated weeds
- Provide implementation strategy for the prioritization tool

Alligatorweed

Diffuse knapweed

Reasons to Prioritize Populations

- CDFA and County Ag Depts. 100 years of eradications
- Budget cuts decrease weed programs statewide
- Species-level assessments have limitations
- CDFA tracking over 1,700 active populations
- Need strategic process to identify the highest priority populations of the high-priority species

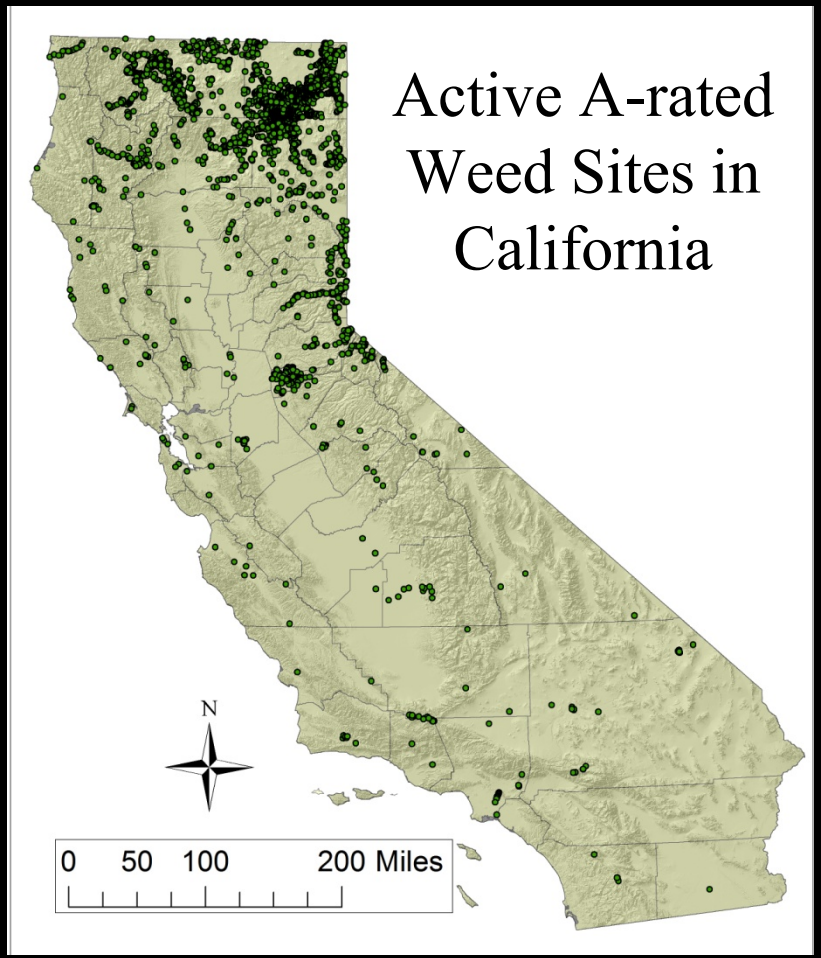
Leafy spurge

Steps to Build a Prioritization Tool

- Identify and inventory (GIS) weeds
- Choose ranking criteria
- Weight ranking criteria
- Score ranking criteria
- Rank populations
- Assess available resources
- Choose eradication targets

Biddy-biddy

Identify and Inventory Weeds



- CDFA A-rated Weeds

- WMA Dirty Dozen
- Cal-IPC High Alerts

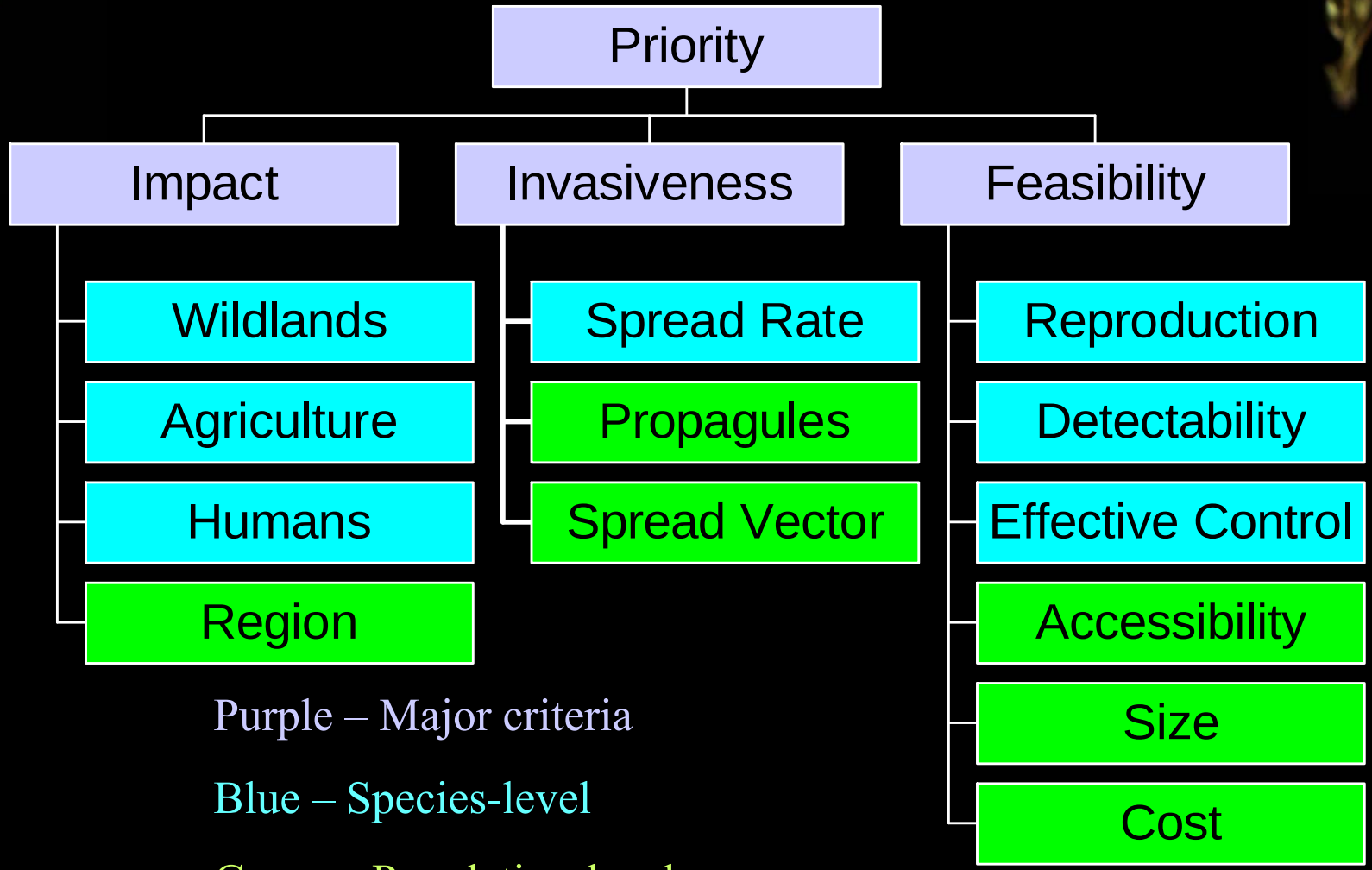
Fertile capeweed

Choose Ranking Criteria

- Choose criteria that contribute most to the decision to eradicate
  - Impact
  - Invasiveness (potential rate of spread)
  - Feasibility of Eradication
- Arrange in a hierarchy

Halogeton

Ranking Criteria Hierarchy



Purple – Major criteria

Blue – Species-level

Green – Population-level

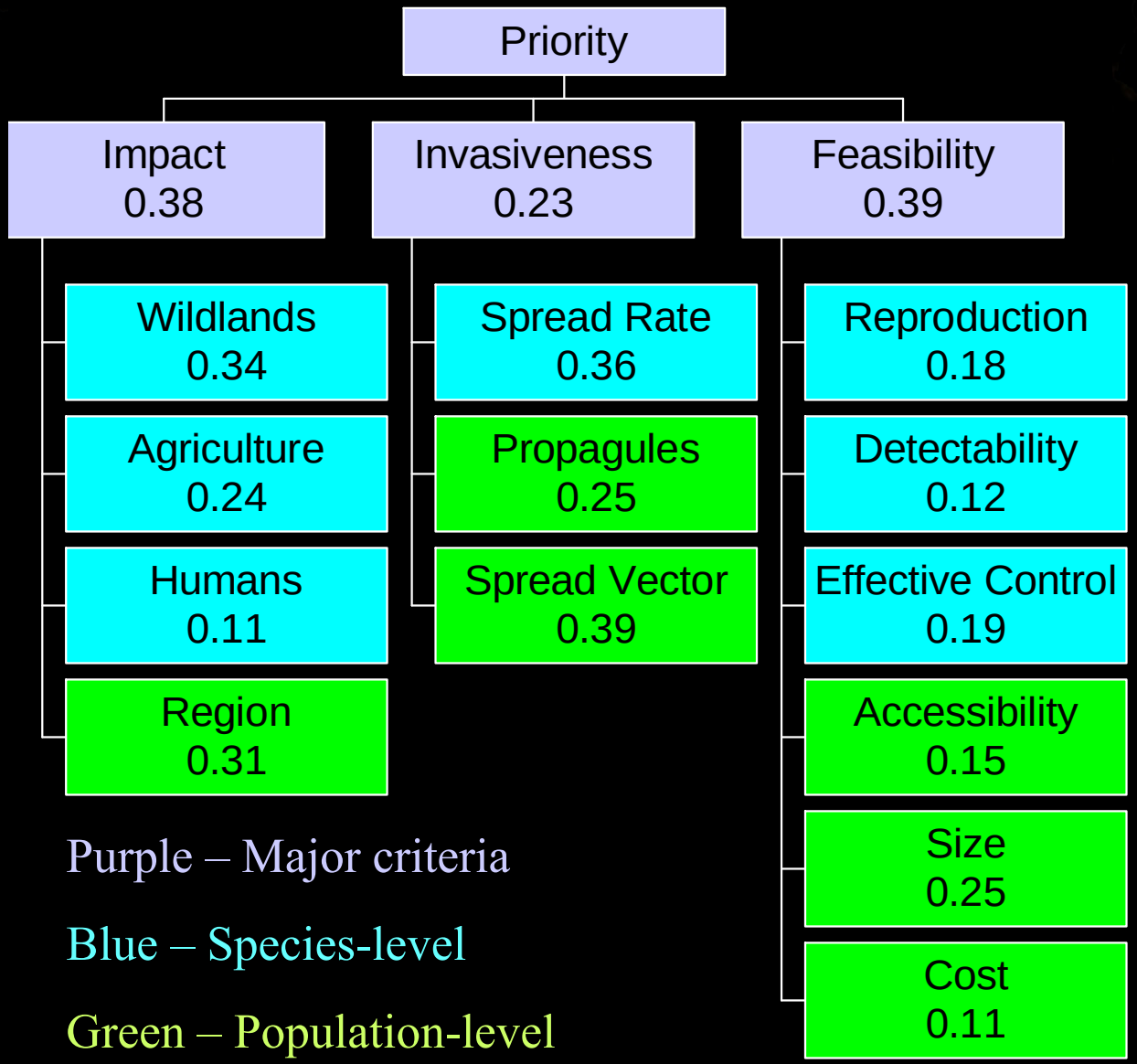
Common crupina

Weight Ranking Criteria

- Analytical Hierarchy Process
  - Mathematical process utilizing paired comparisons of criteria to calculate weights
- Used by Parks Victoria, Australia (1992) and Santa Monica Mtns NRA (2007)
- Experts (15) from CA and AUS

Iberian starthistle

Ranking Criteria Weights



Purple – Major criteria

Blue – Species-level

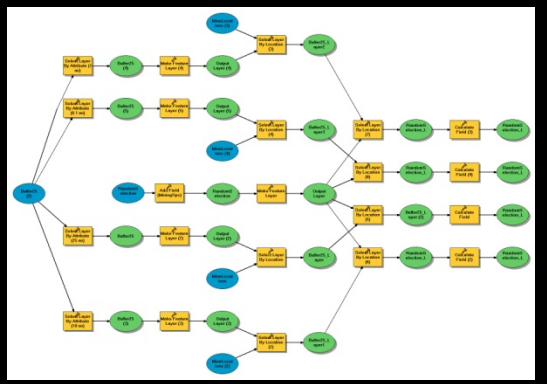
Green – Population-level

Musk thistle

Score Ranking Criteria

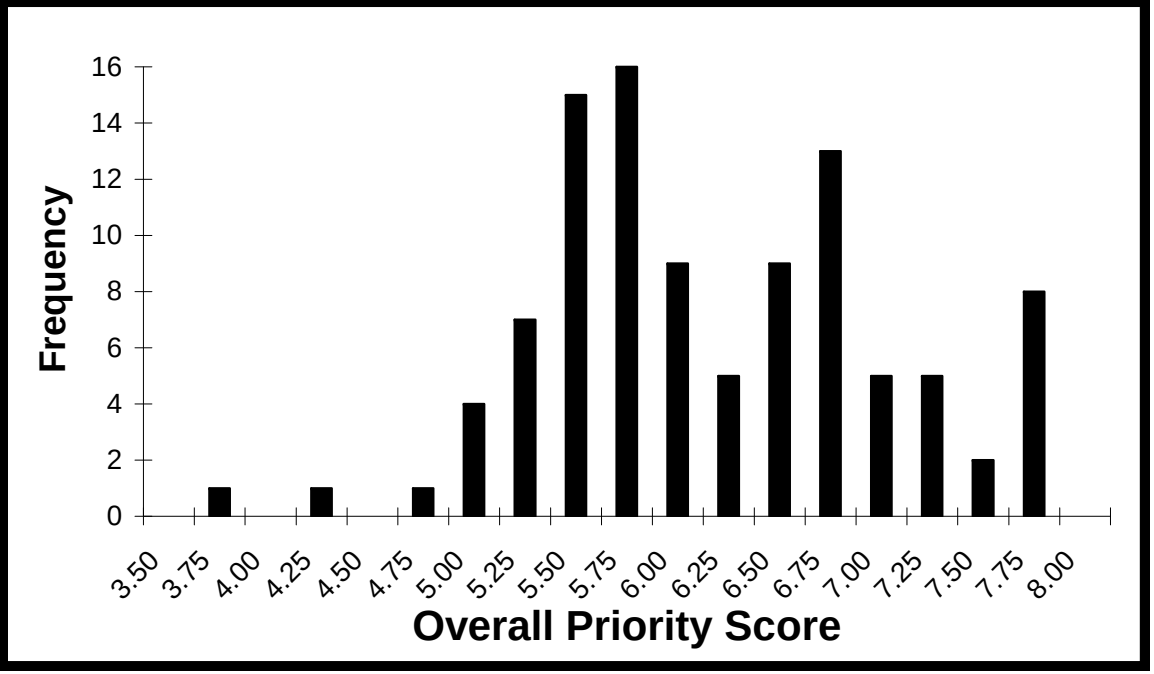
- Scale to emphasize high priority attributes
  - 10 = very high; 6 = high; 3 = medium; 1 = low
- Species-level assessments
  - Cal-IPC Plant Assessment Forms
  - *Weeds of CA and other Western States*
  - Expert interviews
- Population-level assessments
  - ArcGIS geoprocessing models

Illyrian thistle



Calculate Overall Priority Rank

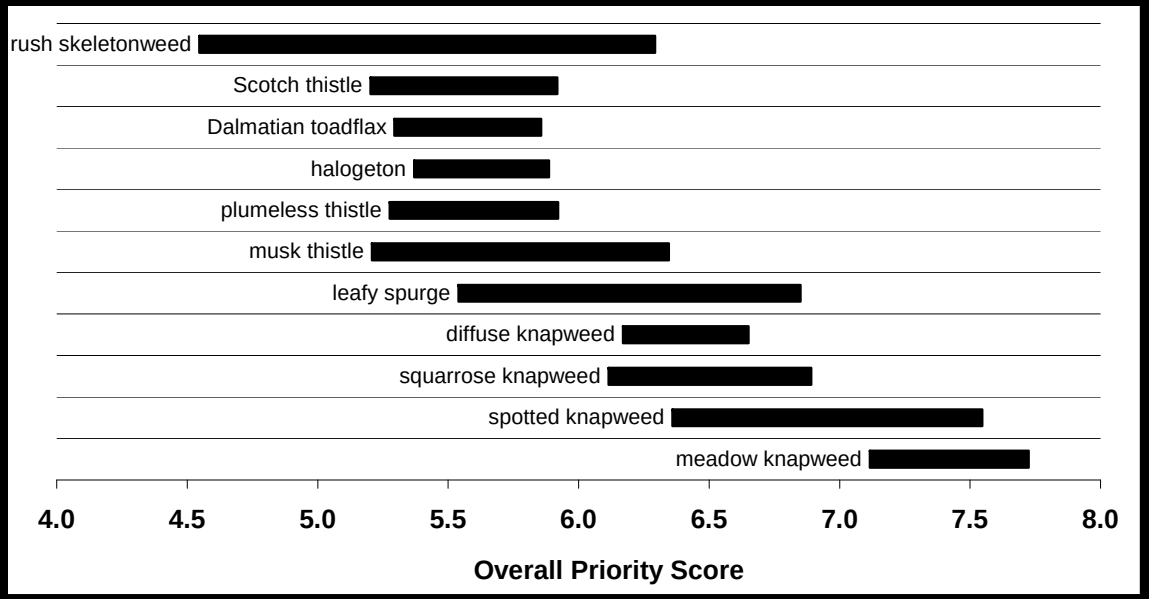
- Major criteria = $\Sigma(\text{Score} * \text{Weight})_{sub}$
- Overall = $\Sigma(\text{Score} * \text{Weight})_{major}$



Results

Halogeton

- Species do not clump in final ranked output



Assess Resources
Choose Targets

- Consider external circumstances
- Use WeedSearch™ tool to estimate cost & probability of success
- 60:30:10 approach
- Track progress using performance measures
  - Pete Holloran, Cal-IPC 2006 Proceedings
- Re-evaluate as more data become available

Skeletonweed

Summary of the Method

1. Set management goals
2. Identify priority species
3. Inventory (GIS) populations
4. Develop decision hierarchy
5. Weight criteria
6. Score populations
7. Rank populations
8. Choose targets

Punagrass

Fertile capeweed

Conclusions

- Regional eradication achieves clear benefits
- Prioritization tools traditionally used to focus resources
- Species-level assessments do not allow for regional and population-level consideration
- This prioritization scheme is designed to address eradication of individual populations
- By strategically targeting weed populations, we minimize future spread and mitigate future impacts

Perennial sowthistle

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- UC Davis Graduate Student Association

Musk thistle